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AUTHOR Rayman, Jack R.
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ABSTRACT

Liberal arts campuses are feeling a need to provide better career education services for their undergraduate students. The DISCOVER Foundation has developed a comprehensive computerized career guidance system for grades 7 through 12 which not only provides career information, but also performs such tasks as teaching students decision-making skills and helping them to clarify their values. This system, which is being adapted for a college level computerized careers course, provides guidance through 12 50-minute modules of interactive content. Some tools and techniques developed by other guidance professionals, e.g., Holland's Self-Directed Search, have been incorporated in the System with permission, and provisions have been made to accommodate individual differences. Each of the DISCOVER system modules is described. (CHV)

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DISCOVER:
A COMPUTERIZED CAREERS CURRICULUM

BY

Jack R. Rayman

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DISCOVER: A Computerized Careers Curriculum

Jack R. Rayman
Western Maryland College
Westminster, Maryland 21157
(301) 848-1113

Introduction

Critics of post-secondary education and particularly liberal arts education have become increasingly vocal in recent years. Caroline Bird's book, *The Case Against College*, calls college the "dumbest investment of all." Colleges themselves seem to be less than secure as evidenced by their recent prime-time media blitz in an attempt to convince the public of their slogan, "College—it's worth it." It is this author's premise that much of the "irrelevance" ascribed to post-secondary education results from the inability and unwillingness of the liberal arts faculty to acknowledge that most students will some day be forced to "earn a living" so that they can afford the luxury of "living a life." The "good life" as liberal arts advocates envision it is an option to most people only if they are also fortunate enough to have "the good job." As Blanche D. Blank put it in her *AAUP Bulletin* article entitled, "Degrees: Who Needs Them?,". . . there is far more evidence that work can make college meaningful, then that college can make work meaningful." A recognition of this fact may eventually lead to the so-called "infusion of career education" into the curriculum of our educational institutions as called for by Kenneth Hoyt and others in the U.S. Office of Education (1975).

In the meantime, however, students continue to hold unrealistic expectations about the value of a college education as occupational preparation. Most students have poorly specified career objectives, a limited understanding of the occupational world, limited access to occupational information and placement facilities, and poorly developed job search skills. A survey of university seniors regarding the frequency of student needs for student personnel services conducted by Carney and Barak (1976) at Ohio State University found that the number-one area of concern (expressed by 37 percent of those surveyed) was choice of major or career. Clearly, college and university students feel the need for improved career services and delivery systems. McGrath (1974), along with numerous administrators in higher education, suggests that, in fact,the success of many institutions in retaining and recruiting students will lie in their willingness to provide services for undergraduates that relate careers, values, and general education.

Perhaps the best solution to this problem would be the integration of career development theory and relevant career information into the curriculum of all college major programs. Unfortunately such an approach meets great resistance from many faculty members to whom the term "career education" is an anathema. Liberal arts faculty members are particularly sensitive to any program which might alter the purity of their discipline. To them the idea of injecting career information into the curriculum conjures up thoughts of the ivy covered liberal arts campus being overrun by legions of wrench toting auto mechanics. Because of this resistance, most liberal arts campuses have resorted to developing separate career courses (usually non-credit) in an attempt to meet the student demand for greater career understanding and awareness. Such courses have met with only limited success.

Computers and a Career Curriculum

In the past decade a number of concerned social scientists have been studying career development with an eye to developing treat-

ments and interventions which may facilitate career development outside the traditional classroom situation. One highly innovative approach has been the use of the computer to deliver career information and services via cathode ray tube terminals. Recently, the DISCOVER Foundation (located on the Campus of Western Maryland College) has developed a comprehensive computerized career guidance system for grades seven through twelve which not only provides career information, but also performs such tasks as teaching students decision-making skills and helping them to clarify their values.

Through the financial support of the Exxon Education Foundation, this author is now directing the adaptation of the DISCOVER Computerized Career Guidance System for use at the college level. This college-level system will provide a computerized careers course which will allow college students to greatly enhance the value of their education by increasing its relevance to the occupational world. The computer has a number of capabilities which make it a particularly valuable tool for the purposes of delivering career information and services.

1. It can store, search, retrieve, relate, and update large data files with ease and accuracy.
2. It can interrelate computer-stored data about a user with data about schools and occupations in a way that creates new information for the user.
3. It is capable of simulating structured interviews with a high degree of "personalization" through the use of cathode ray tube terminals with light pens.
4. It is capable of providing individualized attention to many users simultaneously for many hours per day.
5. It is capable of monitoring a user's progress in career decision making and of providing appropriate feedback, clarification, or review.
6. It has the potential to provide high quality career service without being perceived as a threat by the faculty.

Further evidence in support of using the computer in the delivery of career services stems from the evaluation of its effectiveness in currently operational systems at the high school and junior high levels (Bowlsbey, Rayman & Bryson, 1976; Pyle & Stripling, 1976; Maola, 1974; Chapman, Norris & Katz, 1973; Harris, 1972; Myers, et. al., 1971; Melhus, 1971; Price, 1971; Impelleteri, 1968). A summary of the evaluation of existing computer-based systems indicates that:

1. They are enthusiastically accepted and easily used by students.
2. They cause an increase in conversation about career planning.
3. They cause measured increases in vocational maturity, occupational exploration, occupational knowledge, self-knowledge, and specification of career plans.
4. Students prefer to get career information from a computer rather than from books, files, and other traditional sources.
5. Some career guidance functions can be done as well by the computer as by counselors, at a lower per-hour cost.
6. The computer is perceived by many users as being a less threatening purveyor of career information than a counselor.

Based on the capabilities and evidence outlined above, DISCOVER—a computerized career development system—appears to be an ideal means of delivering a "careers curriculum" to college students.

Content of the DISCOVER System

DISCOVER is a systematic career development program designed to enhance normal career development for college-age students. The study of career development theory makes it clear that a career development system, or "careers curriculum," should include at least the following components: (1) self-information, including values, interests and competencies, (2) exploration of occupations in a systematic way, (3) teaching and low-risk practice of career decision making, (4) relationship of self-information to occupational alternatives, and (5) informational assistance with the implementation of career choice.

DISCOVER provides assistance in all of these areas through twelve fifty-minute modules of interactive content. Data about the user—including name, course, and grades; test information; extracurricular activities; and work experience—are stored in the system for use in comparing occupational or training requirements with the user's past experience. Some tools and techniques developed and copyrighted by other guidance professionals are used within DISCOVER by permission, and in some cases with royalty agreements. Examples of these are Holland's Self-Directed Search (1972) and Super's Career Decision Tree (1975). Seven large data files—occupations, four-year colleges, two-year colleges, technical and specialized schools, apprenticeships, military training programs, and graduate and professional schools—support the student's search for occupational and educational alternatives. In summary, DISCOVER is a combination of originally developed interactive dialogue and simulations, of instruments and tools used by permission of other developers, and of originally developed and borrowed data files.

The "main line" modules of the system are graphically depicted in Figure 1. The titles and numbers of each module correspond to the brief descriptions provided in a later portion of this paper. The position of each module on the arrow-shaped diagram is based on a developmental approach to career guidance. Super's Developmental Stages (1963) and Tiedeman & O'Hara's Decision-making Paradigm (1963) are plotted at the bottom of the diagram to depict the association which exists between the content of each module and these two developmental theories. In the DISCOVER system a person of low vocational maturity would be advised to begin with Module 1A (at the left end of the arrow) and to proceed in numerical order through Module 8 and its sub-modules (at the tip of the arrow). DISCOVER does, however, accommodate individual differences of interest and vocational maturity by allowing the user to enter the system at any point, to use it in any order, or to receive a suggested sequence through the system by taking an instrument called the Survey of Career Development which is contained in the entry module (an administrative section of the system which orients the user to the system and monitors use). The system contains one administrative module (the entry module), eleven "main line" modules and nine informational modules which are described here.

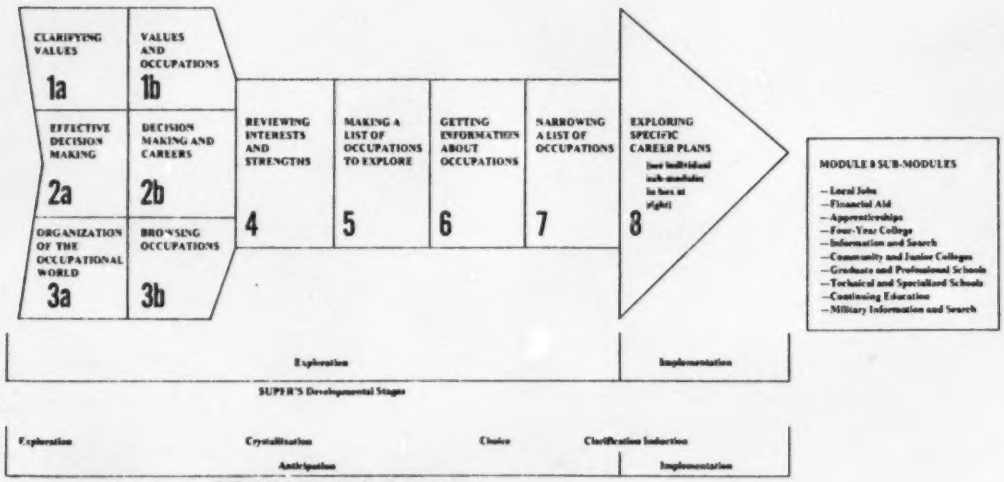

Figure 1

Diagram of the DISCOVER System

Entry

The entry module introduces the user to the many special features of the system and teaches him/her how to use the terminal. It monitors each person's use of DISCOVER, recording each entry and exit point to facilitate long-term use and review. Each user has the opportunity to complete an online Survey of Career Development (Rayman & Super, 1975). This survey is scored and the results serve as the computer's guide in suggesting which modules of the system will be most appropriate for a given user.

Clarifying Values

This module contains a number of experiences which lead the user to think about what a value is, to analyze personal values, and to decide upon actions to implement those values.

Values and Occupations

This module defines nine specific occupationally-related values as identified by Katz (Chapman, Norris & Katz, 1973). These definitions are followed by a series of exercises to help the user develop a good understanding of the nine occupationally-related values. The student may then rate the personal importance of each of these nine values and ask the computer to search its data file for occupations which can provide the combination and weighting of the values assigned. The list of occupations thus generated is retained for later use in the system.

Effective Decision Making

This module attempts to teach a planful decision-making process by presenting the steps of the decision-making process in example and flowchart form. The system provides a number of exercises designed to illustrate and provide practice in the decision-making strategies (impulsive, delaying, painful) and assists the user to identify his/her present style of decision making.

Decision Making and Careers

This module makes use of a "career decision tree" (Super, 1975) as an organizing principle for understanding how decisions affect occupational choice. Since each of the twenty branches of the tree represents a group of occupations, the tree structure is used (1) to show the key decisions which led to entry into a given occupation, (2) to plot a given user's course up the branches of the tree, (3) to simulate the career paths of others, and (4) allow the user the opportunity to "play" his/her own life in a variety of ways by making decisions in this low-risk simulation.

Organization of the Occupational World

This module presents the world of work by way of two organizing principles; the data-people-things-ideas division (which is the American College Testing Program's refinement of the *Dictionary of Occupational Titles* classification system) and the Holland (1973) system. A number of exercises are presented to give the student practice at using these classification systems; the student's responses are monitored for the purpose of providing more instruction if needed.

Browsing Occupations

This module makes use of the Holland classification system presented in Module 3A as an organizational structure by which the user can browse the world of work. The module allows him/her to touch any two points of the Holland hexagon and to receive a list of occupations which fall in that particular segment of the circular world of work. The user may select titles from the list and receive a one-display description of the occupation's work setting and work tasks. This module contains descriptions of 320 occupations.

Reviewing Interests and Strengths

This module is John Holland's *Self-Directed Search* (1972). This instrument is a self-report of the user's career-related interests, experiences, and competencies. The

Making a List of Occupations to Explore

This module provides the user with five alternate ways to make a list of personal vocational options (1) by relationship of occupations to personal work values, (2) by use of the results of the *Self-Directed Search*, (3) by selecting titles from a list of occupations by the terminal, (4) by combining selected occupational characteristics (such as salary level, place of work, level of training, degree of independence, etc.) and/or (5) by relating favorite school subjects to occupations.

Getting Information About Occupations

This module allows the user to get extensive information about the occupations on his/her list. By the voluntary selection of as many as twenty-one questions, the user may receive information about an occupation, its duties, benefits and limitations, educational requirements, future outlook, and additional sources of information. The user may also review his/her own student record (of grades in related courses, related work or course experience, present rank in class, etc.) against the requirements of the occupation or its prerequisite training. The module also provides the capability to compare two occupations by calling in data about both simultaneously. The user leaves this module with a list of occupations in which he/she has serious interest. This list may be a shortened form of the list with which the user entered the module, or it may be a new list which has been generated on the basis of information gathered in this module.

Narrowing a List of Occupations

The user enters this module with the list of occupations from the previous module or with a new one which he/she generates at the beginning of the module. The purpose of this module is to assist the user to narrow the list further so that he/she leaves the module with a first choice occupation in mind and a limited number of others in priority order. This narrowing is assisted by the capability to (1) ask for additional information about any occupations on the list, (2) compare information about two occupations, and (3) analyze the remaining occupations in light of identified work values, desired level of training, and interests and competencies. Finally, the user is asked to remove occupations which are no longer of interest and to put the others in priority order. The user leaves the module with a top-priority selection.

Exploring Specific Career Plans

The user enters this module with one specific occupation in mind at a time. The system identifies for the user all of the possible paths of training to the selected occupation. The user may choose the path of entry which he/she wishes to explore in depth and branch to any of the following sub-modules of the system.

Local Jobs

This module provides an informational section about how to seek a job. It also provides a search strategy for finding a job in the local area with the characteristics desired by the user. Use of the search strategy requires that each local site develop a local job data bank.

Financial Aid

This module provides three capabilities: (1) definition of standard financial aid terms; (2) information about how to obtain financial aid, including an on-line assessment of student financial need (based on a short form of ACT's Pre-planning Financial Statement); and (3) information about available sources of financial aid.

Apprenticeships

This module provides two capabilities: (1) answers to common questions about apprenticeship programs; and (2) search strategies to find apprenticeable occupations, including locating local companies which sponsor apprentices in the user's chosen occupation (requires local data file development).

data, collected via the items on the instrument, give the user a focus for exploration in the world of work. The results of the instrument are interpreted to the user "on-line."

Four-year College Information and Search

This module is a very extensive one which has two divisions: (1) exhaustive information about college admission and selection, and (2) a search strategy. The search strategy draws upon a data file of all four-year colleges and universities in the nation, collected and maintained by the American College Testing program. The strategy allows the user to combine characteristics in the following areas: approximately 200 majors, cost ranges, enrollment ranges, geographic locations, levels of competition for admission, student characteristics (test and class rank, sex, and racial/ethnic membership), type of control, type and size of community, type of institution, type of school year calendar, and a variety of special features. Combination of the student's selected variables produces a list of colleges which have the desired characteristics. Five displays of specific information are available about each college: entrance requirements, general information, characteristics of the freshman class, majors offered, and cost and financial aid.

Community and Junior Colleges

This module provides two capabilities: (1) answers to common questions about community and junior colleges, and (2) search strategies to find a college. Two strategies are provided: search of local colleges only or search of a nationwide file. DISCOVER sites may choose to use only the local search. The DISCOVER-provided college data file contains the data with which to do both searches.

Graduate and Professional Schools

This module provides a search through a national data file of graduate and professional schools making use of characteristics very similar to those used in the four-year college search.

Technical and Specialized Schools

Similar to other modules in this group, this one provides general information about technical and specialized schools and a search strategy to find those which will provide the training needed for entry into a specific occupation. The data file provided by DISCOVER is a national one, containing information about approximately 11,000 schools. The local site may choose to use only a part of this file.

Continuing Education

This program has two sections: (1) general information about adult and continuing education, and (2) instruction on how to find adult-continuing education opportunities in the local area. A local site might choose to enhance this module by adding a local data file of continuing education opportunities.

Military Information and Search

This module provides answers to a large number of typical questions about the military. Additionally, it provides a search strategy to find the specific program within any branch of the military which provides the training needed for entry into a specific civilian occupation. The module contains the data file published in the Department of Defense *Military-Civilian Occupational Source Book* (1975).

Discussion

In the past decade a great deal of time, energy, and effort have gone into the development of computer-assisted instructional technology for the delivery of courses in the traditional disciplines. The project described in this paper has drawn on this technology to deliver a not-so traditional "careers curriculum" to undergraduate students. At this writing the college-level version of the DISCOVER system has undergone only preliminary field trials. Under the sponsorship of the Exxon Education Foundation a

carefully controlled field test of the system is scheduled to begin in September 1977. It is expected that this field test will provide answers to the following questions.

1. Do liberal arts students respond favorably to the computerized delivery of such a "careers curriculum?"

2. Is the operation of such a service cost feasible?

3. Will college and university faculty members accept and endorse a "careers curriculum" and more particularly, the computerized delivery of such a curriculum?

4. What effects will the system have on users? It is expected that students who use the DISCOVER system will report some or all of the following effects:

(1) They will show an increase in knowledge and awareness of personal values, competencies, and interests.

(2) They will show a significant increase in cognitive knowledge about and awareness of Holland's six occupational clusters.

(3) They will show an increase in career decision-making and planning skill.

(4) They will show significant movement toward specification of both educational and career goals.

(5) They will show an increase in vocational maturity.

(6) They will show an increase in vocational exploratory behavior.

Colleges and universities in increasing numbers are looking to computer technology as a means of holding the line on rapidly increasing personnel services costs. Many institutions are reluctant to become involved in the innovative use of the computer for the delivery of a "careers curriculum" because of the lack of quality information about costs, effectiveness, and student acceptance. The 1977 field test of DISCOVER will be a significant step toward the development of a "Computerized Careers Curriculum."

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